

A.32 Delta Button-Celery (*Eryngium racemosum*)

A.32.1 Legal Status

Delta button-celery (*Eryngium racemosum*) is listed as endangered under the California Endangered Species Act (August 1981). It is not listed under the federal Endangered Species Act. Its Heritage Ranking in the California Natural Diversity Database is G2Q/S2.1, which indicates that globally (G) and within the state (S) there are either between 6 to 20 viable element occurrences of this species, 1,000 to 3,000 individuals of this species, or 2,000 to 10,000 acres where this species occurs. Its state threat level rank is “very threatened.” The “Q” portion of the rank indicates that unresolved taxonomic questions remain for this rare species (NatureServe 2008).

The California Native Plant Society (CNPS) List ranking of 1B.1 for Delta button-celery indicates that it is rare, threatened, or endangered in California and elsewhere, and is considered by CNPS to be seriously endangered in California with more than 80 percent of occurrences threatened. Plants with a List rank of 1B are considered by the California Native Plant Society to meet the definitions of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endangered Species Act) of the California Fish and Game Code.

A.32.2 Species Distribution and Status

Range and Status

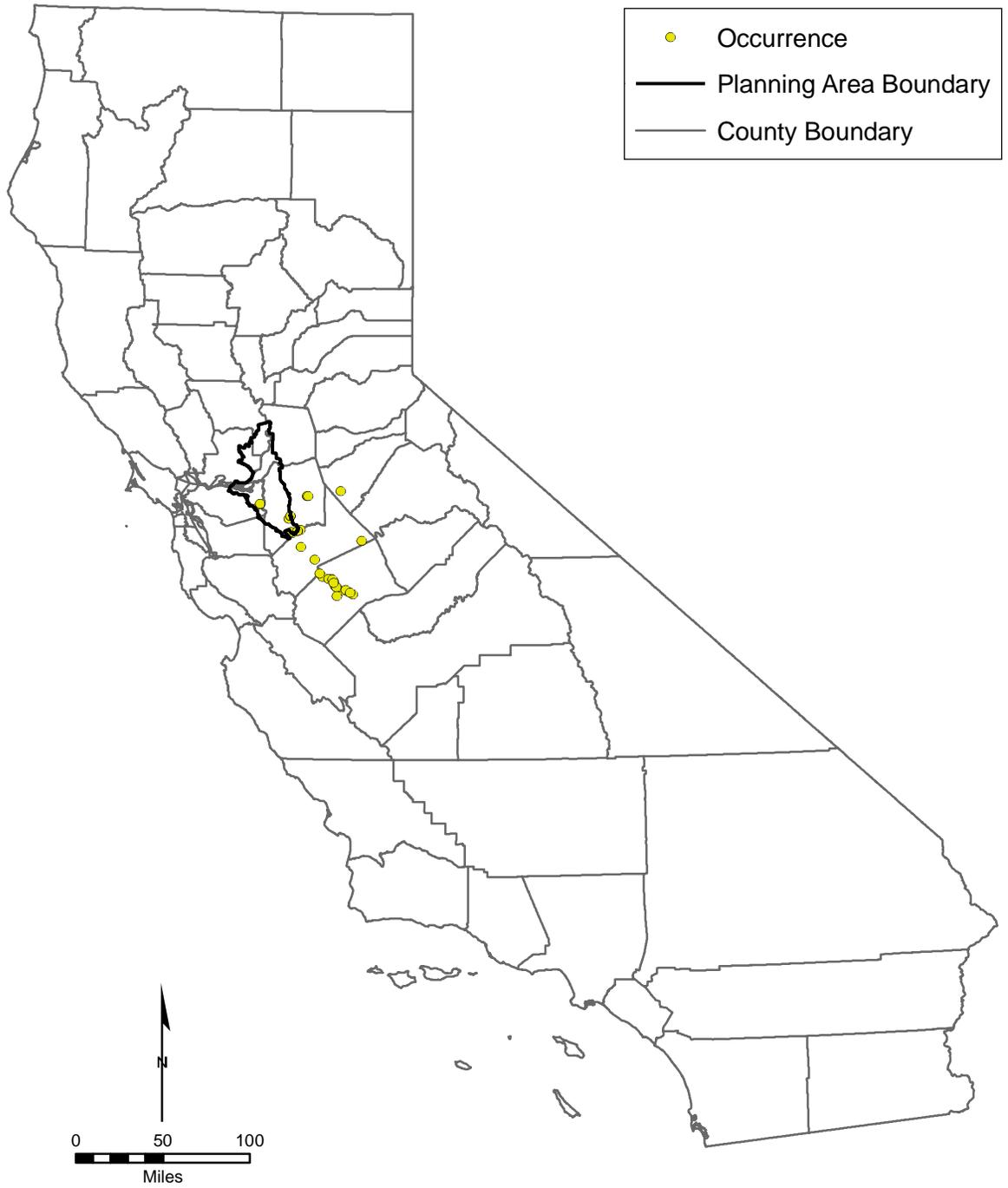
The range of Delta button-celery extends from San Joaquin County in the north, to Stanislaus and Merced Counties in the south, to Contra Costa County in the west, and Calaveras County in the east (Figure A.32.1).

Delta button-celery is endemic to the San Joaquin Valley, south of Brentwood, California (NatureServe 2008). All 26 reported occurrences are from Contra Costa, San Joaquin, Calaveras, Stanislaus, and Merced Counties with the greatest number in Merced County. All reported localities are between 15 and 100 feet in elevation, except one location at 240 ft in Stanislaus County and one at 1,100 ft in Calaveras County. However, the herbarium voucher specimens for the two occurrences in the Sierra Nevada Foothills, Salt Spring Reservoir in Calaveras County and Turlock Lake in Stanislaus County have recently been examined and were determined to have been erroneously identified (R. Preston pers. comm.). Six of the recorded occurrences have been extirpated by agricultural expansion and disturbance (NatureServe 2008).

Extant occurrences are on private land, and on land owned by California Department of Fish and Game, U.S. Fish and Wildlife Service, and other public agencies. Occurrences on state and federally owned land are within designated wildlife areas and wildlife refuges.

Distribution and Status in the Planning Area

Delta button-celery is known to occur in two locations in the BDCP Planning Area, one on the alluvial plain of Kellogg and Marsh Creeks immediately west of Discovery Bay, and one along the San Joaquin River northeast of Tracy (Figure A.32.2). The population near Discovery Bay was last observed in 1998 in a small area with about 1,500 individuals in alkali sink habitat with iodine bush (*Allenrolfea occidentalis*), alkali heath (*Frankenia salina*), and saltgrass (*Distichlis*



Source: California Department of Fish and Game, CNDDDB, 2008.
Consortium of California Herbaria, 2008.

Figure A.32.1. Delta Button-Celery Statewide Recorded Occurrences

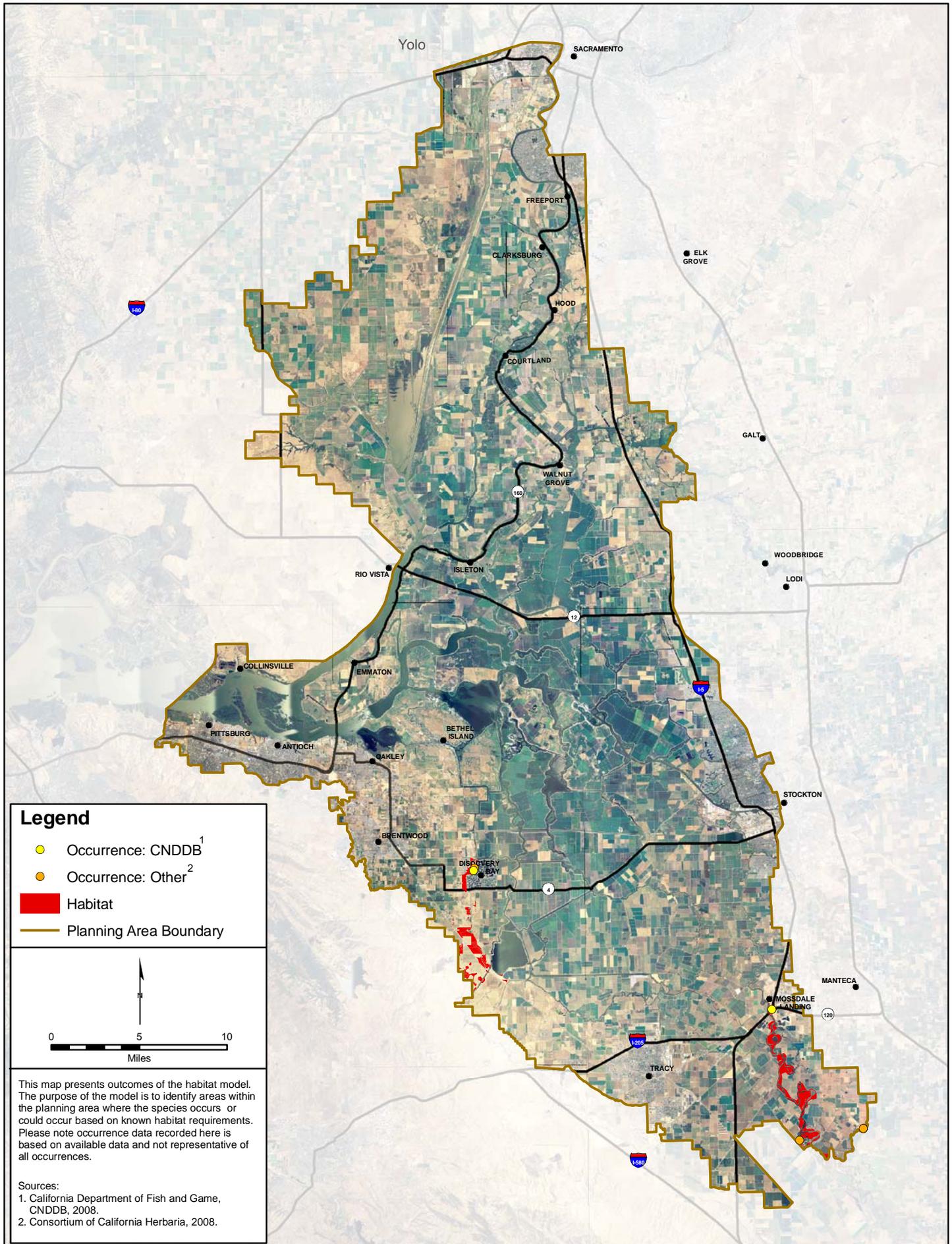


Figure A.32.2. Delta Button-Celery Habitat Model and Recorded Occurrences

1 *spicata*) (NatureServe 2008). The other occurrence in the BDCP Planning Area, located about 3
2 miles south of Lathrop, was first observed in 1984 and is believed to have been subsequently
3 extirpated due to development of a walnut orchard.

4 Two occurrences have been recorded near the edge of the BDCP Planning Area. Both of these
5 occurrences may have been extirpated. One was about 2.5 miles northeast of Vernalis, and the
6 other was at the northeast end of Caswell Memorial State Park. Both sites were last visited in
7 1985 and the habitat was deemed unsuitable at that time.

8 **A.32.3 Habitat Requirements and Special Considerations**

9 Based on its current and historical distributions, Delta button-celery occurs in two habitat types.
10 One habitat type is seasonally scoured and inundated swales, depressions, and clay flats in the
11 floodplain of the San Joaquin River (D. Woolington pers. comm.). The specific location of
12 occurrences may shift depending on the disturbance and flooding regime. As a disturbance
13 follower, there is no strong fidelity to a particular soil or vegetation type, but occurrences are
14 primarily reported on alkaline clays deposited within bands of coarser textured soils and willow
15 scrub vegetation. The associated species in this habitat type are characteristic of frequently
16 disturbed riparian bottom lands and include turkey tangle fogfruit (*Phyla nodiflora*), spike rush
17 (*Eleocharis* spp.), American bird's foot trefoil (*Lotus purshianus*), Goodding's black willow
18 (*Salix gooddingii*), and common sunflower (*Helianthus annuus*).

19 The other habitat type is alkaline clay deltas of Coast Range tributaries that are deposited
20 immediately above the flood basin of the San Joaquin River where plant cover is typical alkaline
21 sink vegetation. The associated species in the alkaline sink vegetation include saltgrass, alkali
22 heath, and iodine bush (NatureServe 2008).

23 **A.32.4 Life History**

24 Delta button-celery is a prostrate biennial to short-lived perennial herb that germinates following
25 flooding in areas adjacent to rivers and streams in the San Joaquin Valley (Hickman 1993). The
26 sprawling stems are generally 4 to 20 inches in length (Hickman 1993). It is unique as it is
27 California's only native *Eryngium* species that produces roots and juvenile leaves at its stem
28 nodes and its spiny flower heads are arranged in an elongated raceme instead of a compact cyme
29 (Hickman 1993). California's *Eryngium* species can be difficult to differentiate based on
30 morphological characteristics because individuals with characteristics that are intermediate
31 between different species are common (Hickman 1993). It flowers from June to September
32 (CNPS 2008).

33 **A.32.5 Threats and Stressors**

34 Threats to the species include agricultural habitat conversion, channelization and channel
35 maintenance activities, overgrazing, dredging, and invasion of habitat by non-native plant
36 species (DFG 2008, NatureServe 2008). Some occurrences have been eliminated by flood
37 control activities and conversion of lowlands to agriculture including all of the occurrences in
38 San Joaquin County and most in Stanislaus County (DFG 2008). Many occurrences along the
39 San Joaquin River in Merced County are threatened due to reduced flooding because of
40 controlled releases from Friant Dam and the construction of an extensive levee system (DFG
41 2008).

1 **Agriculture.** A substantial portion of the suitable habitat for the Delta button-celery is also
2 prime agricultural land. Much of the suitable habitat for this species has been developed in
3 various forms of agriculture, thus removing this species and severely altering that habitat. The
4 known occurrences that have been extirpated have been converted to agriculture (NatureServe
5 2008).

6 **Channel Maintenance Activities.** Past channel maintenance has resulted in changes to the
7 nature of the habitat and severe disturbance of adjacent areas (Natureserve 2008). More
8 importantly, channel maintenance lessens the degree and frequency of flooding, reducing
9 suitable habitat for this species.

10 **Overgrazing.** Overgrazing may adversely affect this species, but grazing may benefit the
11 species by keeping the habitat open between floods and by controlling competing species such as
12 Baltic rush (*Juncus balticus*). In addition, heavy grazing at one site did not appear to prevent
13 occurrence of this species (DFG 1986). Additionally, the saltgrass covered bottom lands of the
14 San Joaquin River basin have been heavily grazed by large cattle ranching operation since the
15 1820s.

16 **Dredging.** Dredging of waterways may reduce the extent of floodplain inundation, which
17 appears to be necessary for seed germination, growth, and the maintenance of habitat openings
18 that Delta button-celery may require (Natureserve 2008).

19 **Invasion by Non-Native Plant Species.** Non-native invasive plant species compete with the
20 Delta button-celery for habitat. Since the San Joaquin River floodplain habitat is subject to
21 periodic natural disturbance (scouring), the habitat is ideal for many native and non-native
22 ruderal species as well. Some of these species include common sunflower (*Helianthus annuus*)
23 and cockle bur (*Xanthium* spp.), which may shade out Delta button-celery (NatureServe 2008) as
24 has been noted at two protected sites in San Luis National Wildlife Refuge (NWR) and Merced
25 NWR (NatureServe 2008).

26 **A.32.6 Relevant Conservation Efforts**

27 The Delta button-celery occurs or formerly occurs at several publicly-owned properties including
28 Caswell State Park, Merced National Wildlife Area, San Luis National Wildlife Area, and the
29 North Grassland Wildlife Area.

30 **A.32.7 Species Habitat Suitability Model**

31 **Habitat.** Delta button celery habitat was identified as all areas between the levees from the
32 Mossdale Bridge to Vernalis and as Natural Seasonal Wetlands and Grasslands on Brentwood
33 (Bc), Grangerville (166), Marcuse (Mb), Solano (Sh, Sk), and Vernalis (269) soils within the San
34 Joaquin Basin (i.e., south of the mainstem San Joaquin River). Vegetation types designated as
35 species habitat in this model correspond to the mapped vegetation associations in the BDCP GIS
36 vegetation data layer. For this species, a significant misclassification of land cover by DFG
37 occurred north and south of the Discovery Bay area where intensive agriculture was classified as
38 annual grassland and those parcels were deleted from the area of predicted habitat. Additionally,
39 other areas of potential habitat that had been developed were also deleted.

40 **Assumptions.** Historical and current records of this species indicate that its distribution is
41 limited to the San Joaquin River Basin where it occurs in two discrete habitat types (Figure
42 A.32.2). In the floodplain of the San Joaquin River, it occurs on seasonally scoured and

1 inundated swales, depressions, and clay flats (D. Woolington pers. comm.). The specific
2 locations of the occurrences may shift depending on the disturbance and flooding regime. As a
3 disturbance follower, there is no strong fidelity to a particular soil or vegetation type, but
4 occurrences are primarily reported on alkaline clays deposited within bands of coarser textured
5 soils and willow scrub vegetation. The other habitat type is alkaline clay deltas of Coast Range
6 tributaries that are deposited immediately above the flood basin of the San Joaquin River where
7 plant cover is typical alkaline sink vegetation or various types of grassland (CNDDDB 2008,
8 NatureServe 2008).

9 **A.32.8 Recovery Goals**

10 A recovery plan has not been prepared for this species and no recovery goals have been
11 established.

12 **Literature Cited**

13 CNDDDB (California Natural Diversity Data Base RareFind). 2008. California Department of
14 Fish and Game, Sacramento, CA. Ver. 3.1.0 with data generated on June 29, 2008.

15 CNPS (California Native Plant Society). 2008. Online Rare Plant Inventory. Accessed on
16 September 8, 2008. Available at: <http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi>.

17 DFG (California Department of Fish and Game). 1986. California Native Plant Status Report for
18 *Eryngium racemosum*. Unpublished report, internal in DFG. 5pp

19 DFG (California Department of Fish and Game). 2008. State and Federally Listed Endangered,
20 Threatened, and Rare Plants of California. July, 2004. Species Accounts – Plants.
21 Accessed on September 8, 2008. Available at:
22 http://www.dfg.ca.gov/wildlife/species/t_e_spp/docs/2004/t_eplants.pdf

23 Hickman, J.C., ed. 1993. The Jepson Manual: Higher Plants of California. Berkeley: University
24 of California Press.

25 NatureServe. 2008. NatureServe Explorer: An online encyclopedia of life [web application].
26 Version 7.0. NatureServe, Arlington, Virginia. Accessed on September 9, 2008.
27 Available at: <http://www.natureserve.org/explorer>.

28 **Personal Communications**

29 Preston, R. (Jepson Herbarium Volunteer and Jepson Manual 2nd ed. treatment of the Genus
30 *Eryngium*). Email correspondence with John Gerlach on September 11, 2008.

31 Woolington, D. (USFWS Supervisory Wildlife Biologist, San Luis National Wildlife Refuge
32 Complex). Email correspondence with Tamara Klug on September 18, 2008.